potentialities for harm, and so on. But when it became realized that the open-air treatment gave the most effective results; that the long duration of it was something inherent in the circumstances; that there was no adequate alternative to it; that, in fact, to ignore it was tantamount to not doing the best for those afflicted with tuberculosis, then the difficulties were rapidly overcome, even for the poorest hospital patients. No doubt it is more satisfactory when we can achieve rapid cures of constitutional maladies, a fact that partly explains the gratification with which the recent Ehrlich-Hata discovery has been received. Still, it must be remembered that from the very nature of things there are certain modes of treatment which it is dangerous to press forward too rapidly, such as the reëducation of the system by means of tuberculin, antirabic and other vaccines. Psychoanalysis, which is essentially a reëducative treatment that modifies mental trends of many years' standing, is just such a treatment where it is impossible to press. As a matter of fact, it compares very favorably in many respects with the sanatorium treatment of tuberculosis, for it requires less time, no special apparatus, buildings, nursing staff, and so on, and, above all, can be carried out in an ambulatory service when the patient is about his ordinary work; indeed, it is very desirable that the patient should have some employment or other interest unless he is totally incapacitated. As to the limited scope of the treatment, we already find in practice that there is a wide range over which it is conveniently applied, and there is no doubt that with the goodwill of the medical profession this range would be very considerably extended; although many intrinsic difficulties exist, many of the alleged ones are largely fictitious, being invented or exaggerated by those who really oppose the treatment on other grounds.

In these few remarks I am fully aware that I have not enumerated all the objections that have been brought forward against the psychoanalytic treatment, and have not even fully discussed any one of those I have mentioned, but I trust I have succeeded in my aim of illustrating the fact that there do exist answers to all of them which in the opinion of those who have properly investigated the matter are entirely adequate.

APLASTIC ANEMIA, WITH REPORT OF A CASE.

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The red corpuscles of the blood are subject to constant loss and replacement. The best evidence of their continuous destruction within the body is the continuous flow of bile pigment, a derivative of hemoglobin. Red cells are also lost by hemorrhage, internal and external, slight and severe. In the female, menstruation periodically removes large numbers. In health, of course, an equally constant formation of new corpuscles in the red marrow maintains the number at the normal level.

It is obvious that a deficiency of red cells, that is, a condition of anemia, might result from excess in the destructive processes or from deficiency in the reconstructive functions. There is still much obscurity as to the relative importance of these two factors in the different anemias, but it is probable that in the majority the chief causative factor is increased destruction. As a result of this primary loss of hemoglobin-bearing cells, and by way of compensation for it, changes take place in the marrow, and new corpuscles are poured into the blood in increased numbers. If the loss of red cells is extreme, the stimulation of the erythropoietic functions may be so great that the spleen and other organs not normally concerned in the production of red corpuscles may assume this role, or, more properly, resume it, since it is one of their normal functions in the embryo. Thus, the degree of anemia depends not only upon the severity of the process which is destroying the red cells, but also upon the efficiency of the compensatory regenerative processes. Schaumann[1] compares this mechanism to the way in which the functional efficiency of a diseased heart depends not only upon the severity of the valvular leak, but also upon the degree of compensatory muscular hypertrophy. This paper is a study of certain anemic conditions, in which the compensatory processes are strikingly deficient. In classifying the anemias on the basis of blood examinations, three types stand out with fair distinctness. In their clinical and anatomical features the cases correspond fairly well with the same grouping.

1. The orthoplastic or benign group includes nearly all the anemias secondary to definite morbid states—infections, neoplasms, parasites, chronic intoxications, as well as chlorosis, anemias from acute or chronic hemorrhage, or from faulty hygiene and nutrition. The hemoglobin is reduced in greater proportion than the reds (low color index). Qualitative changes, as seen in smears, are, except for achromia, usually slight in proportion to the severity of the anemia. The average size of the reds is normal or smaller than normal (low volume index), and if nucleated reds are present, they are mostly normoblasts. The anemia itself is often of little clinical importance. Even though severe, it remains essentially benign, and recovery is to be expected with removal of the cause. The yellow or fatty marrow of the adult is changed partially or completely to red, cellular marrow, but it is always normal red marrow, with great preponderance of normoblasts and neutrophilic myelocytes. The change is quantitative rather than qualitative. Obviously such marrow is capable of producing more blood cells

than before. It has undergone compensatory hyperplasia, in order to make up the loss of cells incident to the causative disease.

2. The metaplastic or pernicious blood picture is seen chiefly in the condition or conditions known as pernicious anemia. The anemia produced by infections with Bothriocephalus latus is also of this type, as a rule, and, exceptionally, syphilis, hepatic cirrhosis, and other diseases commonly producing anemia of the benign type will cause instead a metaplastic change. The blood picture is characterized by high color and volume indices, the increased size of the red cells being perhaps the most important feature. The reds show marked changes in form and color. Megaloblasts are almost always found, and they exceed the normoblasts in number. Clinically, the anemia is a much more serious matter than in the first group. Its course is malignant and usually fatal. At autopsy the normal yellow marrow is found to be universally replaced by red celluluar tissue. The changes are not only more intense than in the benign forms, but they are different in quality, the principal histological peculiarity being the increase in megaloblasts.

The known facts concerning those conditions in which the pernicious picture occurs as an obviously secondary manifestation, particularly in Bothriocephalus infections — conditions which frequently recover when the cause is removed — these facts seem to indicate that the changes in the blood and marrow represent a reaction of the hemopoietic organs to long-continued, perhaps specific, destruction of corpuscles. We do not know whether compensation is more efficient or less efficient than in the orthoplastic cases, so far as the capacity for turning out new cells is concerned. Nor can we say, at least in regard to some, that the marrow has not been injured beyond repair. But it is safe to assume that the destruction of red cells has been extreme, and the reaction on the part of the blood-making organs very intense.

3. The aplastic type of anemia is very rare, but its great theoretical significance makes it worthy of the closest study, for much light will be shed upon the nature of the processes by which the erythropoietic organs repair an anemia by a consideration of the exceptional cases in which those reparative processes fail to occur. Clinically the cases show considerable variation. They are alike, however, in the rapid advance of the anemia and the promptly fatal termination. The case presently to be described is, I believe, the only one in which a remission has occurred after the aplastic features have been clearly recognized. Hemorrhages are present in most cases, varying in severity from a few scattered petechiæ to severe hemorrhagic purpura. Other than this the cases show clinically only the features common to all grave, rapidly advancing anemias.

The blood picture is striking and easily recognized. The anemia advances so rapidly that the reds and hemoglobin are usually very low at the first observation. The color index is usually low. The red corpuscles as seen in smears show but slight changes in form and coloring, even though their numerical reduction is extreme. Nucleated reds are absent or present only in very small numbers. Remarkable changes occur in the leukocytes, the total number being greatly decreased, this decrease involving only the granular forms. The lymphocytes remain present in their normal numbers, while the polymorphonuclear neutrophiles, eosinophiles, and mast cells are absolutely and relatively diminished. This loss of granulocytes is extreme. Mast cells and eosinophiles are often entirely lacking, and sometimes even the neutrophiles can be found only by searching. Platelets are also greatly decreased. The essential features then so far as the blood is concerned are intense loss of red cells and granular leukocytes—those blood elements, and only those, which have their origin in the bone marrow. It is to the marrow then that one looks for an explanation of the disease.

The macroscopic changes in the marrow are not uniform. Sometimes this tissue is yellow or gelatinous, sometimes red and cellular, sometimes mottled, while in rare instances it is replaced by connective tissue (Assmann[12]). The microscopic findings vary correspondingly, but they are alike in the absence of the cells from which the missing blood elements are derived. In the most typical cases the marrow is yellow, and consists of fat. Erythroblasts, myelocytes, and other cells having to do with the formation of blood corpuscles are few in number or completely lacking. Sometimes smears show only debris without cells. Either the marrow is so extensively diseased that it cannot perform its functions, or it fails, for some unknown reason, to do so in spite of the usual stimulus. This inability of the marrow to respond explains why the cases progress so rapidly and why the characteristic blood picture develops.

In certain cases, though they may not be distinguishable, clinically or hematologically, from those already described, the marrow is red and cellular. Microscopically, however, it is neither normal red marrow nor the megaloblastic tissue of pernicious anemia, for both nucleated red cells and myelocytes are lacking or nearly so. In their place there are found only lymphocytes.

Concerning the significance of this change, there has been considerable controversy. Some consider that the presence of the lymphoid tissue is secondary to the disappearance of the normal marrow structures. Others hold that the lymphoid hyperplasia is primary and that the overgrowth of this foreign tissue has led to the disappearance of the normal marrow elements. It is probable that both views are partially correct, some cases being of the one sort, some of the other.

That primary hyperplasia of lymphoid cells may cause aplasia of the red elements is shown by a case reported by Türk.[2] A typical myeloid leukemia changed to what appeared to be lymphatic leukemia. Shortly before death there was a rapid increase of the anemia, with a decrease of white cells to 940 per c.mm., of which but 6 per cent. were neutrophiles—a typical aplastic picture, involving both the red and white elements. At autopsy the marrow showed lymphoid hyperplasia with almost complete absence of other normal cells. Here there can be little doubt that the aplasia was the result of the crowding out of the blood-forming cells by the overgrowth of the lymphoid tissue.

On the other hand, there are cases, like that of Hirschfeldt,[3] in which it seems equally certain that the lymphoid change in the marrow was secondary to exhaustion of the normal erythroblastic tissue. Here a woman died after an illness of nine months which followed parturition, resembled pernicious anemia, and was marked by profuse hemorrhages. Again, Blumer's case[13] was typical aplastic anemia, associated with lymphoid hyperplasia of the bone marrow. The latter was partly fatty and partly red, from areas of intense lymphoid hyperplasia. The author points out that, as the lymphoid tissue did not occupy the whole marrow cavity, the aplasia could not be explained by mechanical crowding out of the normal elements by the new tissue.

Most cases of aplastic anemia with lymphoid marrow must, however, remain puzzles for the present. Such cases are those of Wolff[4], Senator,[5] and Michaelis.[6] Senator considers them leukemias or pseudoleukemias. Blumenthal and Morawitz,[7] on the other hand, believe the disappearance of the normal elements to be the primary change. Morawitz and Rehn[8] consider the predominant cells in these cases to be not lymphocytes, cells foreign to the marrow, or at least not specific marrow elements, but very early stages of the normal granular leukocytes, that is, promyelocytes or myeloblasts.

A case seen in consultation with Dr. H. H. Germain perhaps belongs to this class. It appeared at first to be noma, and the patient did well for a week after operation. Then he became much worse, and an examination of the blood showed 70 per cent. of hemoglobin, 2,472,000 red corpuscles, and 5000 leukocytes. Nucleated reds were rare, and abnormalities in shape and coloring were but slight. One and only one neutrophilic leukocyte was found during a long search. There were no eosinophiles or mast cells; practically all the white cells were lymphocytes. Perhaps this was lymphatic leukemia with secondary infection of the mouth, perhaps primary infection of the mouth, sepsis, and exhaustion of the marrow, especially in its leukoblastic functions, with disappearance of the granulocytes and secondary or vicarious lymphocytosis.

Such cases are hard to explain. Some of them ought not to be classed as aplastic anemia at all, since the aplasia involved the leukogenic rather than the erythrogenic structures. These two functions are often more or less dissociated in diseases of the class under discussion, sometimes markedly so, as in a case reported by Türk,[9] where, in a case of penumonia and septic endocarditis, the granular leukocytes all but disappeared, the reds remaining normal.

But the anatomical relationship of the cells having to do with the two functions is so close that one can hardly be much affected without involving the other.

There is ample experimental evidence that lymphoid marrow may occur entirely apart from leukemia or related diseases, that it may result from causes commonly leading to anemia, and that the associated blood picture may give evidence of inadequate regenerative activity on the part of the marrow. For the details, the reader is referred to the papers of Blumenthal and Morawitz,[7] Hirschfeldt,[10] Morawitz and Rehn,[8] and Morris.[11] The anemia was produced in these cases by bleeding or by the injection of toxic substances. The results must be applied to the explanation of human aplastic anemia only with great caution, as the blood pictures in the experimental animals differed in important respects, such as the persistence of a normal proportion of polymorphonuclear neutrophiles, from that of the disease in man. But they at least prove that lymphoid marrow does not always signify leukemia.

In some cases it is probable that the lymphoid change is more apparent than real, the lymphocytes not being themselves markedly increased or decreased, but being merely what is left after other cells, normally predominating, have been removed. It is probable that the condition of the marrow previous to the onset of the aplasia has an influence on the histological conditions found at autopsy. One would hardly expect to find the same thing in a previously healthy adult in whom a severe hemorrhage has failed to call forth the usual regenerative changes in the fatty marrow, as in a child, or in a person in whom aplasia is but a terminal event in an illness of a sort usually associated with red marrow. In fact, several writers refer to the lymphoid tissue in their cases as being loosely packed, and suggesting normal marrow minus everything but lymphocytes, rather than the intense infiltration of leukemia.

Concerning the pathogenesis of aplastic anemia, it is conceivable that such a condition might arise from incapacity of the blood-forming organs alone, but in most cases at least there is doubtless also the factor of increased destruction of red cells. Thus, Aubertin[14] distinguishes "anémie *par* anhématopoiése" and "anémie *avec* anhématopoiése." Anemia *from* anhematopoiesis is seen only in leukemia or other destructive disease of the marrow. Simple primary aplasia of the marrow does not exist, and, except in these conditions, aplastic anemia is always anemia *with* anhematopoiesis, one of the usual causes of anemia always being present. This view is also held by Pappenheim.[15] Hemorrhage, sepsis, the unknown noxus of pernicious anemia, or some other agency causes an acute anemia, and the usual compensatory regenerative changes in the marrow fail to occur, perhaps because the same agency that caused the anemia has also injured the marrow. Aplastic anemia is not, therefore, a disease of itself, but merely a condition which may arise in anemias from various causes.

In discussing the etiology of aplastic anemia then we must consider what forms of anemia are likely to have this unfortunate complication. Hirschfeldt[3] describes a case in which typical pernicious anemia changed, after severe hemorrhages, to aplastic anemia. Lavenson[16] discusses at length the relations between aplastic and pernicious anemia, and concludes that the former is always a variety of the latter, the differences resulting entirely from the absence of regenerative processes in the aplastic cases. I doubt, however, whether we are justified in making such a sweeping statement. Existing knowledge of the nature of pernicious anemia is limited. We recognize the disease only by observing its clinical course and its hematological features. In the presence of aplasia, this course is greatly modified, and the blood picture, depending as it does on the peculiarities of the regenerative processes in the marrow, are wholly different where these processes fail. Such cases as that of Hirschfeldt, just quoted, are very rare. Aplasia very rarely occurs in preëxisting pernicious anemia, and the compensatory processes in the marrow usually persist to the end. The patient with ordinary pernicious anemia dies, not because regeneration of the destroyed blood elements fails, but because compensation, intense as it is, is no longer able to keep pace with the still more intense hemocytolysis. If aplastic anemia is merely pernicious anemia without compensatory regeneration, that failure of regeneration exists from the first in the vast majority of cases, and, I repeat, our knowledge of pernicious anemia is still far too meagre to permit us to affirm or deny its presence in the absence of all its common diagnostic features.

There is, in fact, excellent evidence that aplasia of the erythroblastic tissues may complicate anemias which are not of the pernicious type. Ehrlich's classical case,[17] which Lavenson includes in his list, followed acutely after uterine hemorrhage the result of abortion in a previously healthy young woman. Hirschfeldt[18] mentions a case in which the disease followed acutely after a severe hemorrhage.

The following case, which occurred on the service of Dr. E. B. Young at the Boston City Hospital, is of similar origin: A perfectly healthy girl, aged sixteen years, suddenly began to flow profusely. After two weeks she was brought to the hospital and much blood clot was evacuated from the vagina. A condition resembling purpura hæmorrhagica rapidly developed, with hemorrhages from gums and skin. The heart was slightly enlarged, with systolic and diastolic murmurs, and a pericardial friction rub. The hemoglobin was 35 per cent., the red corpuscles 1,338,000, and the leukocytes 6000. There were 12 per cent. of polymorphonuclear neutrophiles, 86 per cent. of lymphocytes, 1 per cent. of large mononuclears, and 1 per cent. of stimulation cells. Platelets were almost absent from the smears. Nucleated reds were rare, and no other abnormalities in these corpuscles were noted. She died in a few days. Autopsy was refused.

Cases are reported by De Massary and Weil,[19] Steinhaus and Stordeur,[20] Muir,[21] and Blumenthal,[22] in which hemorrhages played an important part, but the circumstances were such as to make it doubtful whether they were the cause or the effect of the blood disease. But when hemorrhage appears suddenly in a previously healthy individual, as a result of such a well-known and adequate cause as abortion, and where aplastic anemia follows directly and acutely, it seems unnecessary to drag in a hypothetical, preëxisting, pernicious anemia.

Quite recently, Selling[28] has reported several cases of anemia of the aplastic type due to benzol poisoning, and refers to experiments, not yet published in detail, in which the condition was produced in animals by the same agent. Furthermore, true secondary anemia may be complicated by aplasia. Thus, Hertz[29] describes 2 cases in which sepsis seemed to be the important etiological factor. Kranz[23] reports a case of aplasia in anemia from Bothriocephalus latus. Schur and Löwy[24] describe a case after corrosive poisoning. Schwartz's case[25] followed renal abscess in a child, the aplasia involving principally the leukoblasts. One of Blumenthal's[22] had syphilis. Berberis' case[26] followed miscarriage, with hemorrhage and sepsis. Finally, Dickson,[27] in his monograph on the bone marrow, describes and figures degenerative conditions in the marrow of several long-standing cases of sepsis, tuberculosis, and cancer, which he attributes to increased activity followed by exhaustion of the blood-forming cells. Unfortunately, no blood reports are given.

In conclusion then it seems altogether probable that aplasia of the marrow may occur in post-hemorrhagic or destructive anemias of any sort, possibly as a result of direct action of the same toxins which destroy the blood cells, possibly from exhaustion by overactivity.

The prognosis in aplastic anemia is unfavorable. With the possible exception of acute leukemia, no disease of the blood is so rapidly and uniformly fatal. So far as I am aware, the case to be reported is the only one in which even temporary improvement has occurred.

Treatment has not been effectual. It does not seem likely that any drug will have the least influence. Direct transfusion should certainly be done when the condition complicates hemorrhage, and, perhaps, in other cases following acutely after definite causes.

For the privilege of reporting the following case, as well as for material assistance in studying it, I am indebted to Dr. C. B. Wormelle, of Brighton, Massachusetts:

Sherman S., aged five years, had been ill six weeks when I first saw him in consultation with Dr. Wormelle, on June 15, 1907. There was nothing in his past history of importance, except an attack of measles, with pneumonia, several years before. At the beginning of his illness, he was sleeping in the same room with his brother, who was at the time suffering from chronic suppurative disease of the bones, with discharging sinuses on the face and in the groin. This child has since recovered. Sherman's symptoms were those of a rapidly advancing anemia, with irregular fever, often as high as 103°. His only complaints were weakness and slight abdominal pain. Examination showed a well-developed but poorly nourished boy. He was apparently very ill, stupid, and irritable, resisting examination. He was very pale, with the yellow tinge so suggestive of pernicious anemia. There was a small hemorrhagic spot on the forehead, which his mother could not explain. The heart was slightly enlarged to the left, and presented systolic and diastolic murmurs. The other viscera were normal. There was no enlargement of the liver, spleen, or lymph nodes. There was no edema. The reflexes were normal. There was a slight Kernig sign, but no rigidity of the neck. The eardrums were normal.

On the basis of the blood examination, a diagnosis of aplastic anemia was made, and an unfavorable prognosis given. The unexpected happened, however, and he promptly recovered. His color became good, the heart murmurs disappeared, and at the end of a month he was apparently as well as ever.

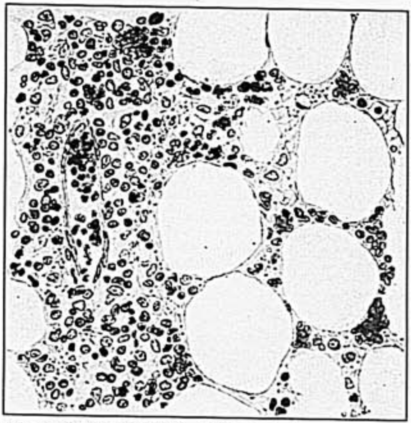
In October of the same year a large ecchymosis suddenly appeared in the right groin, and the old symptoms recurred, with rapidly advancing anemia and high fever. When seen by the writer, on November 11, his condition was about the same as in June. The spleen was still normal, but the liver edge was palpable, and lymph nodes, varying from a quarter to a half inch in diameter, could be felt in the groins, axillæ, and neck. A slight nose-bleed had just occurred. Minute punctures made for the purpose of obtaining blood either bled profusely or caused tender, hemorrhagic swellings. On November 16, about a month from the beginning of the relapse, the child vomited a large amount of blood, and died.

	June 10.	June 15.	July.	November 11.
Hemoglobin, per cent.	40% (Tallqvist).	12% (Sahli).	85% (Tallqvist).	25% (Sahli).
Red corpuscles	2,000,000	790,000	3,700,000	1,500,000
White corpuscles	6000	1970	Decreased	5030
Polynuclear neutrophiles	....	8.8 per cent.	....	3.2 per cent.
Lymphocytes	....	88.0 "	....	90.8 "
Large mononuclears and transitionals	....	1.2 "	....	0.4 "
Eosinophiles	....	0.0 "	....	0.0 "
Mast cells	....	0.0 "	....	0.0 "
Myelocytes (neutrophiles)	....	0.4 "	....	0.4 "
Stimulation cells	....	1.6 "	....	5.2 "
Erythroblasts per c.mm.	....	24	....	
Megaloblasts seen	0	2	0	0
Normoblasts seen	0	1	0	1
Changes in reds	....	Slight	....	Slight
Size of reds	....	Small	....	Vol. index 0.69
Platelets	....	Much decreased	....	Almost absent

The blood findings are shown in the table. The first two columns show the rapid advance of the anemia, the reds falling from 2,000,000 to 790,000 in five days. In spite of this low figure, the reds appeared almost normal in smears, and nucleated forms were present only in small numbers. The decrease of platelets was obvious. Leukopenia was striking, and involved the granular leukocytes to a marked extent, the actual number of polymorphonuclear neutrophiles per cubic millimeter being but 173 instead of the normal 4000 to 6000. Eosinophiles and mast cells, likewise formed in the marrow, were absent. The third column shows the extent to which the blood recovered in the remission. The final column shows the blood in the relapse, a week before death. The anemia had not yet become remarkably severe. The volume index, which expresses the average size of the red corpuscle referred to 1 as normal, was estimated after the method of Capps,[30] except that the corpuscles were sedimented spontaneously instead of by the centrifuge.[32] The low figure is like that of benign anemia, and in contrast to the high values commonly seen in pernicious anemia. The leukocytes are higher than before, but there is the same decrease of the granular forms, the absolute number of neutrophiles being 161 per c.mm. The lymphocytes (4577 per c.mm.) are not beyond the normal limits for a child aged five years. On the whole, these are typical pictures of aplastic anemia.

An autopsy was performed by Dr. Timothy Leary, who, it is much to be hoped, will later report upon it at length. There were no important abnormalities except those having to do with the blood and blood-forming organs. The esophagus contained a large clot, and there were small petechial spots on the mucous and serous surfaces. The marrow of the vertebræ was pale red. That of the femur was yellow and jelly-like, and mottled with red. The microscope showed typical fat tissue with abundant hemorrhage between the fat cells, apparently the cause of the red mottling seen in the gross specimens. Here and there about the arterioles there were small islands of nucleated cells. These were almost exclusively lymphocytes. Nucleated red corpuscles, normally so abundant, were very rare, and were small in size. A single group of megaloblasts was found after long search. Granular leukocytes were also rare. Neutrophilic myelocytes, so abundant in normal red marrow, were only found after careful searching. But one eosinophile was seen. There was a diffuse infiltration of the lymph nodes and of the interlobular connective tissue of the liver, with lymphoid cells somewhat suggestive of lymphatic leukemia. The spleen, otherwise normal, contained immense numbers of large epithelioid cells, within which were masses of yellowish-brown pigment.

The red color of the marrow was not due to the presence of regenerative cellular changes, but to hemorrhages, which were present in many other parts of the body as well. The marrow was essentially aplastic, the aplasia involving the leukoblastic (granulocytic) as well as the erythroblastic elements. There is, to be sure, a *relative* increase of lymphocytes in the marrow as well as in the other tissues, somewhat suggestive of lymphatic leukemia, but it must be remembered that the patient was a child, aged five years. At this age the lymphatic apparatus is very active and readily responds to stimuli, and the number of cells of this type is, both in the blood and in the tissues, greater than in the adult. No diagnostic significance then can be given to this finding, nor to the slight increase of lymphocytes in the last examination of the blood. The case is surely not one of replacement aplasia. The amount of lymphoid tissue is at no point great enough to have influenced by its presence other normal structures. The microscopic picture is red marrow minus everything except lymphocytes. Disregarding the hemorrhages, the prominent feature is replacement of normal cells by fat. The lymphocytes have not been thus replaced, but they are themselves little if at all increased.



Bone marrow of Sherman S. Aplastic anemia. Cell island about a small artery on left of picture. Cells mostly lymphocytes. Hemorrhage into tissues between fat cells.

The rarity of giant cells and the concomitant rarity of platelets is in complete accord with the views of J. H. Wright as to the origin of these bodies.[31]

It is difficult, perhaps at present impossible, to determine the primary cause of the anemia in this case. The yellow color of the skin, the marked remission, the iron-containing pigment in the spleen, and the single group of megaloblasts found in the marrow suggest pernicious anemia, but, considering the uncertainties and qualifications imposed by our present lack of knowledge of the disease or diseases known by that name, it is perhaps safer not to venture a diagnosis. Some unknown agency caused this child to become anemic, probably through destruction of red corpuscles. For a time the marrow failed to react, perhaps because it suffered injury from the same noxus. The remission was probably due to temporary recovery on the part of the marrow, since it seems unlikely that this tissue in the condition found at autopsy could have replaced the lost cells so promptly, even if the hemolytic agent ceased its activity. Finally, aplasia again supervened, with or without exacerbation of the destructive process, and from this second attack the child died.

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GRANULOMA PYOGENICUM (BOTRYOMYCOSIS HOMINIS OF THE FRENCH).

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In 1897 Poncet and Dor[1] first described a neoplastic, fungating, pedunculated growth occurring in man, in some respects similar to the so-called botryomycotic tumors at times seen in domestic animals. The growths were pea- to nut-sized, reddish in color, and developed by means of a pedicle from the derma. Histologically, their structure was that of a typical granuloma.

Poncet and Dor found numerous yellowish, mulberry-shaped masses of cocci, which they believed to be identical with the botryomycosis (Bollinger). Their findings were partially confirmed by Nocard and by Leclainche, but later investigators, including Bodin,[2] Crocker,[3] and Hartzell,[4] have shown that these bacterial collections consist entirely of ordinary yellow staphylococci. Why the presence of these organisms should occasionally give rise to this particular type of abnormal cell proliferation is not known (the fibro-adenoma theory of Carriere and Potel, which was founded on the accidental occurrence of a coil gland in one of the tumors, is unquestionably erroneous, and has been generally rejected), but the phenomenon is probably similar in many respects to that observed in the highly vascularized tissue which is commonly known as "proud flesh." Owing to the location of the microörganisms, it is practically impossible to bring about a cure by means of the topical use of antiseptics alone, and a lesion may persist for months in spite of treatment. The pedicle is composed of connective tissue, with numerous bloodvessels, and profuse hemorrhage results when it is severed. Even when the growth is removed in this manner it promptly recurs unless the base is thoroughly cauterized.

The condition is not an extremely infrequent one, and the following typical instance is reported, not because of its rarity, but more for the purpose of calling attention to the clinical features of the lesion, in order that it may be more readily recognized when encountered.

H. M., aged nine years, female, schoolgirl. Referred to me by Dr. J. M. Allen, of Liberty, Mo.

Family History. The cutaneous history of the family is negative.

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[1] Trans. Congrès de Chirurg. de Paris, October, 1897.

[2] Ann. de dermat. et de syph., iii, 259.

[3] Diseases of the Skin, 3d edition, ii, 1081.

[4] Jour. Cutan. Dis., xxii, 520.